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Port Security Waterside Protection

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Outline

- Measures and Recommendations
- The Waterfront Plan
- Waterfront/Port Security Overview
- Waterside Barriers
- Barrier Criteria Issues
- Traditional Security Measures-Enhanced
- Port Security-Summary
- Questions

Waterside Security Measures & Recommendations

Existing Measures

- Minimal Lighting
- Communication Cabling (Ship to Shore)
- Pier access control, which includes guard shack, vehicle barrier/gate, and fencing
- Telephone
- Fire Alarm

Proposed Measures

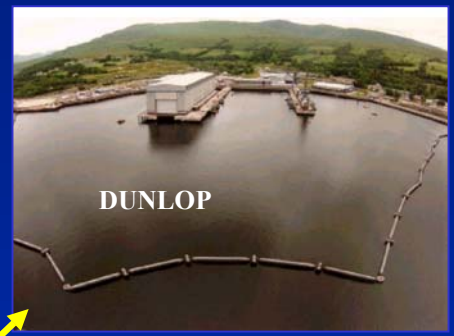
- Waterside Barriers- under development
- Waterside Watch Tower
- Increased Waterside Security Lighting
- Expanded Communications Cabling System for waterside surveillance
- Increased Harbor Patrols

The Waterfront Plan

THE WATERFRONT PLAN

5-Phase Plan	NOTICE TO MARINERS	BOUYS AND BOOMS	WARNING SIGNS	ARMED HARBOR PATROLS	RAMS	ARMED ROVING PATROLS	ARMED SENTRIES	DETECTION DEVICES	COMMUNICATION SYSTEMS	WEAPONS	SHIPS
DETER	★	★	★	★	★	★	★	★	★	★	★
DETECT				★		★	★	★			★
WARN				★		★	★	★	★		★
DENY		★		★	★	★	★				★
DESTROY				★			★			★	★

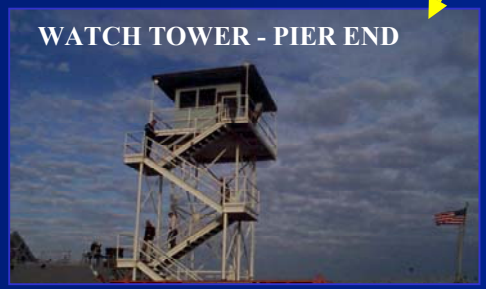
Waterfront/Port Security Overview



WATERFRONT SECURITY

COMMUNICATIONS

LIGHTING



GUARD HOUSE-PIER ENTRANCE

VEHICLE BARRIER

Antiterrorism and Force Protection Considerations in Facility Design

Waterside Barriers

ONE ELEMENT OF AN INTEGRATED SECURITY SYSTEM TO DETER ATTACK AGAINST NAVAL ASSETS

Waterside Barrier Requirements

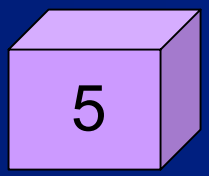
- **Objective**
  - Protect Navy ships from attack by explosive-laden, high-speed boats

- **Threat Definition**
  - Threat definition is difficult due to the extraordinary variety of boats and submersibles available.
  - No official criteria/ threat definition for waterfront barriers (MILSPEC, DoD directive, MNS/ORD, etc.)
  - OPNAVINST C8126.1 (Navy Nuclear Weapons Security Manual) in revision
  - Large, low-speed boats and underwater threats excluded

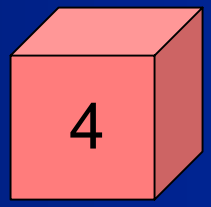
Barrier Effectiveness

Boundaries

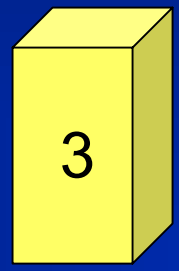
Barriers →



- Visible Line Only
- Line of buoys
- Float line

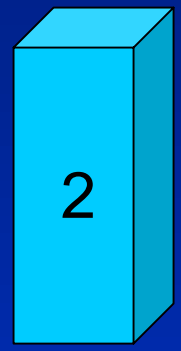


- Doesn't stop boat
- Tuffloat
- Dunlop (21-in)

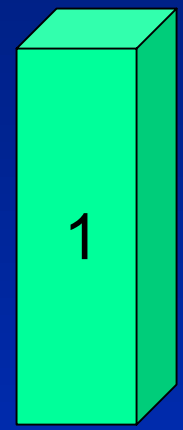


- Probably doesn't stop boat
- Pontoons

- SeaBarrier
- Yodock
- Whisperwave



- Might not stop boat
- Composite camel
- Yokohama fenders
- Dunlop (6-ft)



- Stops boat
- Net w/ piles
- Port Security Barrier
- Dunlop (8-ft)

Float Line

- Locally fabricated from COTS components.
- Will not stop intentional surface craft attack
- Defines restricted area
- Helps identify *INTENT* intent if violated?
- Unknown long-term performance in ocean environment

Category 1 Barriers

DUNLOP

- Pneumatic rubber bladder
- 8 ft dia x 80 ft long - 1800 lbs

Port Security Barrier-PSB

- Steel pontoon support structure with synthetic boat capture net
- 8 ft height x 50 ft long - 8500 lbs
- Secondary net capability (14-ft total height)

Antiterrorism and Force Protection Considerations in Facility Design

Barrier History

DUNLOP

- 10 year use in UK with Dunlop (6-ft) bladder
- Commercial Product (pneumatic rubber bladder w/ internal reinforcing wire)

PSB

- 27 month test (3 units) of an early PSB design

Dunlop Floating Bladders

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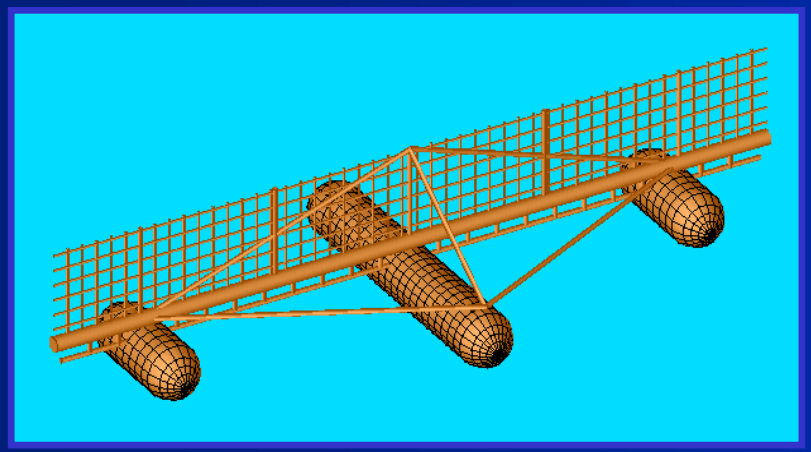
Port Security Barrier



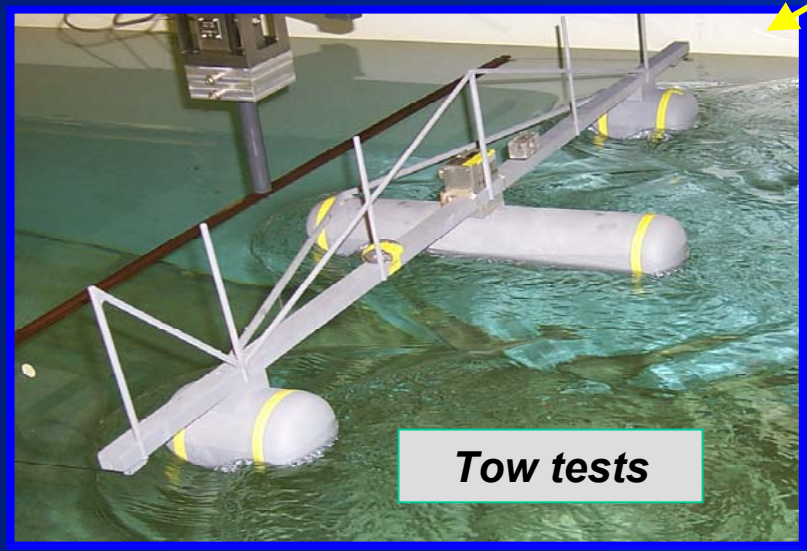
PSB Seakeeping Tests

System tests

(1-ft model)

- Extensive physical model testing was conducted by the U.S. Naval Academy to verify the design.

(5-ft models)



Tow tests

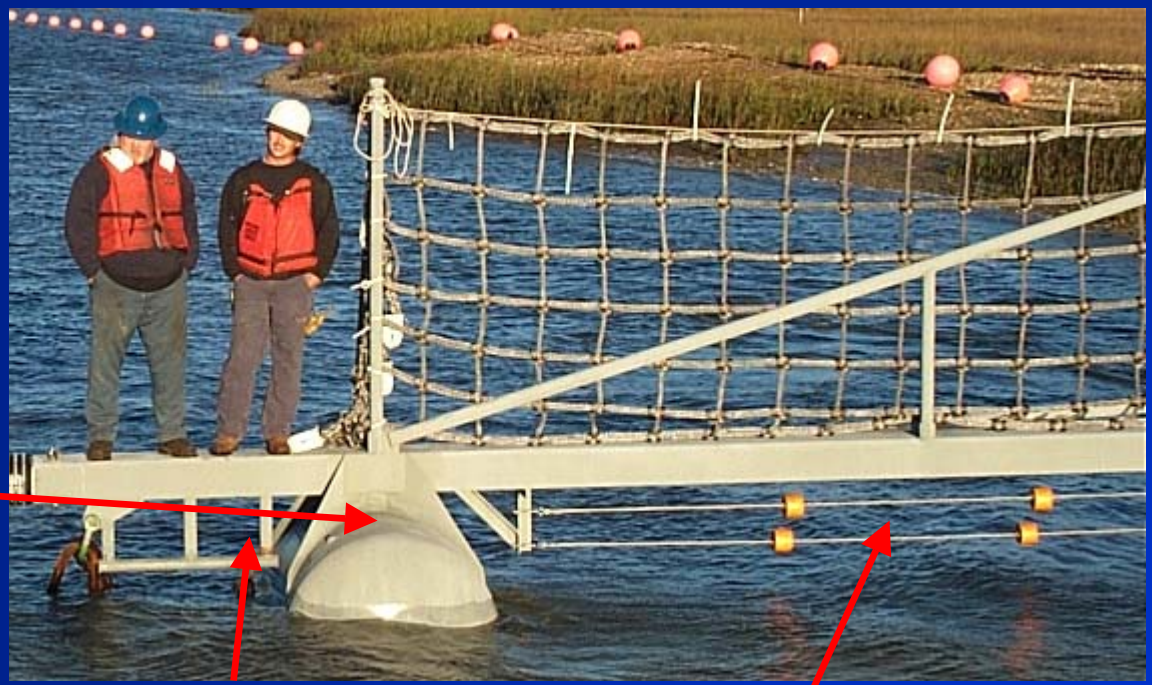
PSB in hurricane waves

PSB Units

The barrier units are each 50 feet long, weight 8,500 pounds and float on 3.5-foot diameter pontoons. A stopping net, that works on the same principle a aircraft carrier arresting gear, extends 8 feet above the water.

ECOLOGICAL CONSIDERATIONS

PSB units are designed to float high in the water and have smooth surfaces for easy marine mammal passage. The pontoons are parallel to current flow and to the direction of gate opening for low resistance. Deadweight anchors are used in case a barrier needs to be relocated.



Connectors

Connections between units is critical because the system was designed to withstand extreme hurricane winds and waves.

MCA CONNECTORS AT BUOYS

Several different types of connectors are being tested in this prototype installation.

ITA CONNECTORS ELSEWHERE

Barrier Operability/Handling

DUNLOP

- Air-filled bladder easily deflated for storage and shipment

- Units can be dragged in/out of water

PSB

- Gate opening loads at maximum operating condition (35kts) is 1/3 to 1/2 that for DUNLOP
- Mooring loads (and mooring hardware size) at a typical survival condition (100 kts) is about 1/2 that for DUNLOP --
- Crane required for handling

➢ ***Handling Experience:*** **Both barrier system gates can be handled easily with small boats (whaler, mike boat) in mild weather; larger boat is required for winds above 15-20kts.** ***A small tug is being used at the initial test site.***

500-FOOT GATE OPERATION

Initial tests showed a Boston Whaler or small tug could open/close the 500-foot gate in calm conditions. Testing will be conducted under various conditions to determine the optimum craft for gate operation. This barrier will be monitored to evaluate long-term performance.

Durability/Maintenance

DUNLOP

- 6-ft Dunlop deployed for about 10 years in UK with good maintenance record
- 20 Year rubber life expectancy
- **Issues:**
  - ***Pneumatic integrity:*** *Air valve integrity; End cap overstress; End cap seal; Module seam integrity*
  - *Temperature effects*

PSB

- Steel pontoon structure painted with ZINC CLAD-11 (80% ZINC water-based -$13/ft^2); 15-20 year life expected with 3-5 yr repaint
- Nylon net is UV protected; 3-5 year life expectancy anticipated
- **Issues:**
  - ***Paint quality control:*** *20% of initial test PSB pontoons show rust. Inadequate paint thickness; Q/A issue; some units to be recoated*
  - *Gate connection*

- Mooring and connecting system inspection and maintenance cycle would be similar for each barrier system

Costs

Barrier	Initial Cost ($/ft)	Barrier Life Expectancy (yrs)	Annual Maintenance ($/ft)	Net Present Value (today's $/ft)
Dunlop	$1,248	20	$21	$1,500
Port Security Barrier	$800	20	$28	$1,144

- PSB & Dunlop costs based on awarded contracts
- Costs include initial costs, moorings, connectors, installation, inspection and maintenance.
- Not included are engineering, design, boats/labor to open/close gates.

Other Considerations

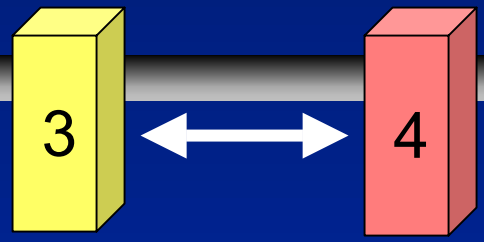
DUNLOP

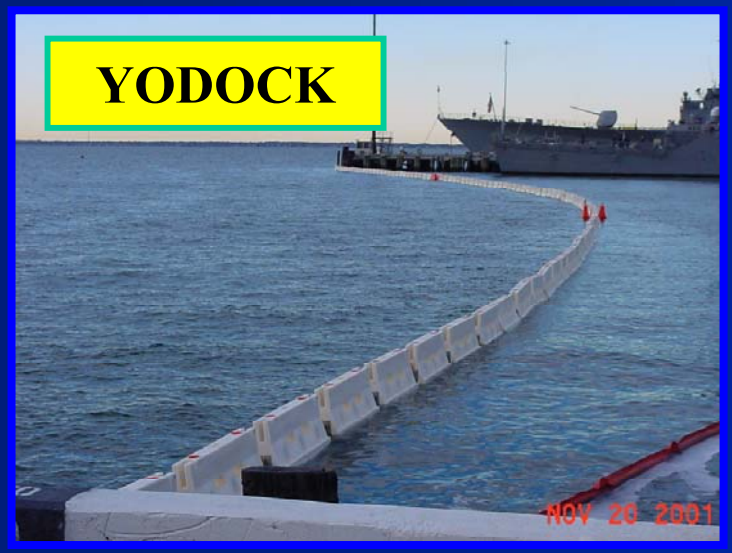
- Simple construction
- Low radar signature
- Mainly thin rubber; vulnerable to cutting
- Current/waves have little effect
- Anticipated good behavior in ice
- Requires gap closure unit between fenders
- Field repair (patching) possible
- Units are self-fendering

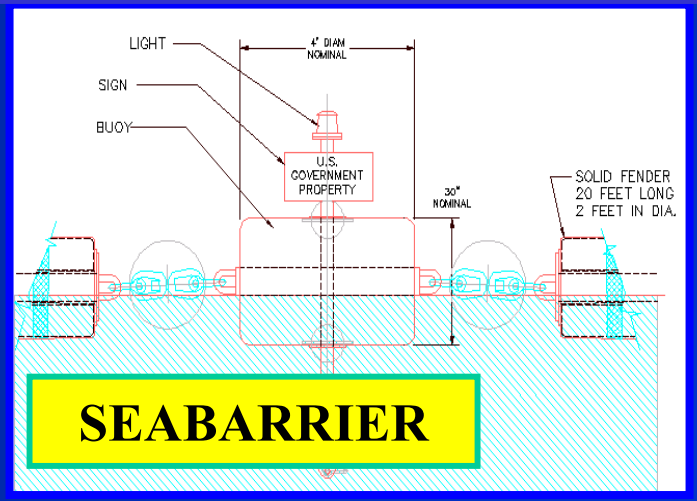
PSB

- Can be modified to meet new needs
- Allows passage of debris and fish
- Steel pontoon structure provides a level of protection in itself
- High radar signature
- Good visibility through net
- Fenders needed on units near gate buoys to protect boats

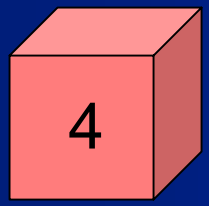
Category 3-4 Barriers







TUFFLOAT Safety/Debris Barrier



- Commercial Product
- Will not stop intentional surface craft attack
- Defines restricted area
- Identifies *INTENT* if violated

Category 4 Barriers

BLUE BARREL BARRIER

4

JERSEY BARRIER

Findings/Recommendations

- **Barrier demos/installations completed or in process**
- **Issues such as Quality Assurance and Design identified for both Dunlop and PSB units currently being addressed**
- **Continued monitoring required to: *refine systems, improve operations, define maintenance requirements***
- **Barrier handling boat should be provided to support barrier operations: *Suitable tug identified***
- **Barrier inspection should be added to *Fleet Mooring Inspection Program***

Barrier Criteria Issues

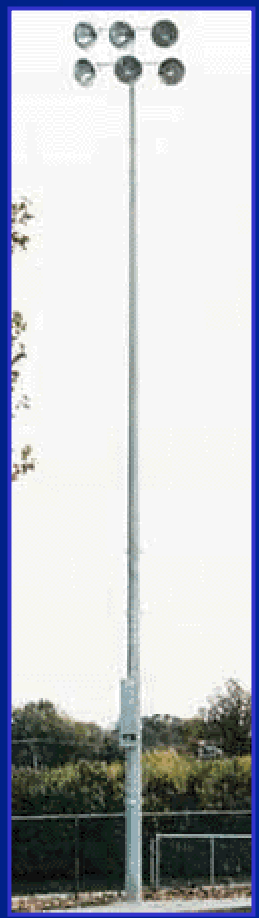
- THREAT
- BARRIER EFFECTIVENESS
- ENVIRONMENTAL DESIGN CRITERIA
- MOORING DESIGN CRITERIA
- PUBLIC SAFETY REQUIREMENTS
- PERMITTING
- COSTS BOTH INITIAL AND LIFE CYCLE
- OPERATIONS AND MAINTENANCE

Watch Tower and Guard Houses

Gate Barriers

Antiterrorism and Force Protection Considerations in Facility Design

Waterside Security Lighting and Communication

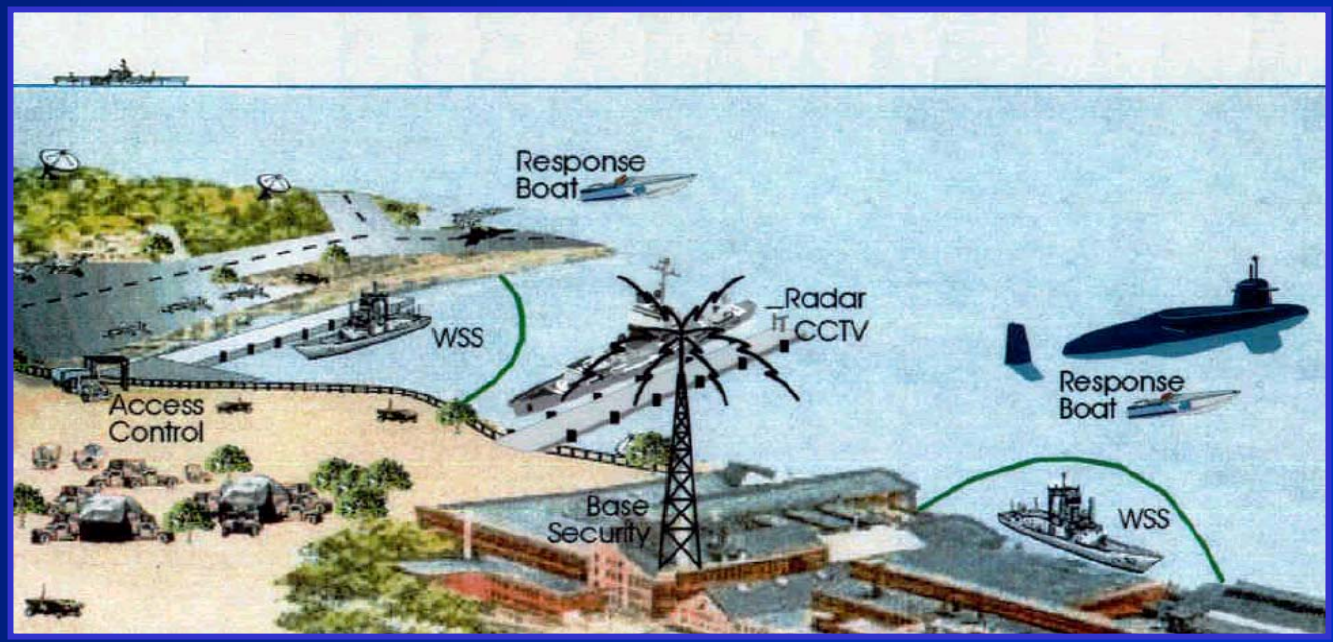


Three-Sided Signage, Typical

INCREASED HARBOR PATROL

Port Security

. . .a program which synchronizes select security programs into comprehensive defensive measures to protect our personnel, information, and critical resources against a wide range of threat attacks, including terrorists, criminals, and saboteurs.



Questions And Concerns

Thank You

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